

## Total Maximum Daily Load Information Sheet

### Blackberry Creek

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#### Water Body Segment at a Glance:

**County:** Jasper  
**Nearby Cities:** Asbury and Joplin  
**Length of impaired segment:** 6.5 miles  
**Length of impairment within segment:** 3.5 miles  
**Pollutants:** Sulfate plus Chloride, Chloride  
**Source:** Asbury Power Plant  
**Water Body ID:** 3184



State Map Showing Location of Watershed

**Scheduled for TMDL development:** 2014

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#### Description of the Problem

##### Designated beneficial uses of Blackberry Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation

##### Use that is impaired

- Protection of Warm Water Aquatic Life

##### Standards that apply

- Sulfate and chloride are linked together in Missouri's Water Quality Standards (WQS), 10 CSR 20-7.031. Section (4)(L)1 states that the concentration of chloride plus sulfate in streams with a 7-day Q10 low flow of less than one (1) cubic foot per second shall not exceed 1,000 milligrams per liter (mg/L or parts per million) for protection of aquatic life.
- There are additional criteria found in Table A of the WQS that chloride alone must not exceed. They are 230 mg/L (chronic) and 860 (acute)<sup>1</sup>.

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<sup>1</sup> Acute criteria apply to short-term exposures to toxic conditions that aquatic creatures can survive without harm. Chronic criteria apply to conditions of long-term exposure. These criteria are much lower than the acute criteria.

## Background information<sup>2</sup> and water quality data

The Asbury Power Plant is a coal-fired, electricity-generating station operated by Empire District Electric Company, or EEC, located about 20 miles north of Joplin, Missouri. It started operations in 1970 as a “mine-mouth” plant that got its coal supply from Pittsburg & Midway Coal Mining Co.

The problem impairing Blackberry Creek stems from the power plant’s fly ash pond. Both sulfate and chloride are by-products of burning coal and end up in this pond. In addition, according to the department’s Division of Geology and Land Survey, the area contains considerable spoil from coal mining, and this particular spoil is naturally high in chloride.

Based on monitoring data collected by EEC, the stream is meeting water quality standards for sulfate and chloride upstream of the plant, but not downstream<sup>3</sup>. While showing trends in water quality, the EEC data is not of good enough quality to use in making water quality assessments. Therefore, the department conducted its own sampling in 2006-08. A water body is judged to be impaired if chronic numeric criteria are exceeded on more than one occasion during the last three years for which data is available. The data gathered showed that both the chloride and the sulfate plus chloride criteria were exceeded on five occasions in 2006 and once each in 2007 and 2008.

### Water Quality Data for Blackberry Creek, 2006-2008

Site	Site Name	Date	SO4 (mg/L)	Cl (mg/L)	SO4 +Cl
4	Blackberry Cr. 2 mi.bl. Asbury PP ash pond	8/8/2006	1200	790	1990
2	Blackberry Cr. 5.6 mi.bl. Asbury PP ash pond	8/8/2006	854	533	887
3	Blackberry Cr. 3.2 mi.bl. Asbury PP	10/19/2006	1940	742	2682
2	Blackberry Cr. 5.6 mi.bl. Asbury PP ash pond	10/19/2006	2560	929	3489
2	Blackberry Cr. 5.6 mi.bl. Asbury PP ash pond	10/25/2006	2640	962	3602
3	Blackberry Cr. 3.2 mi.bl. Asbury PP	5/18/2007	529	197	726
1	Blackberry Cr. 6.9 mi.bl. Asbury PP ash pond	5/18/2007	60	45	105
6	Blackberry Cr. ab. Asbury PP ash pond	9/27/2007	551	4	555
3	Blackberry Cr. 3.2 mi.bl. Asbury PP	9/27/2007	862	619	1481
1	Blackberry Cr. 6.9 mi.bl. Asbury PP ash pond	9/27/2007	402	136	538
3	Blackberry Cr. 3.2 mi.bl. Asbury PP	10/2/2008	1000	420	1420
2	Blackberry Cr. 5.6 mi.bl. Asbury PP ash pond	10/2/2008	361	72	1133
1	Blackberry Cr. 6.9 mi.bl. Asbury PP ash pond	10/2/2008	324	63	987

Source: The Missouri Department of Natural Resources

Notes: SO4 = sulfate; Cl = chloride. Shaded cells indicate exceedance of SO4+Cl water quality criteria.

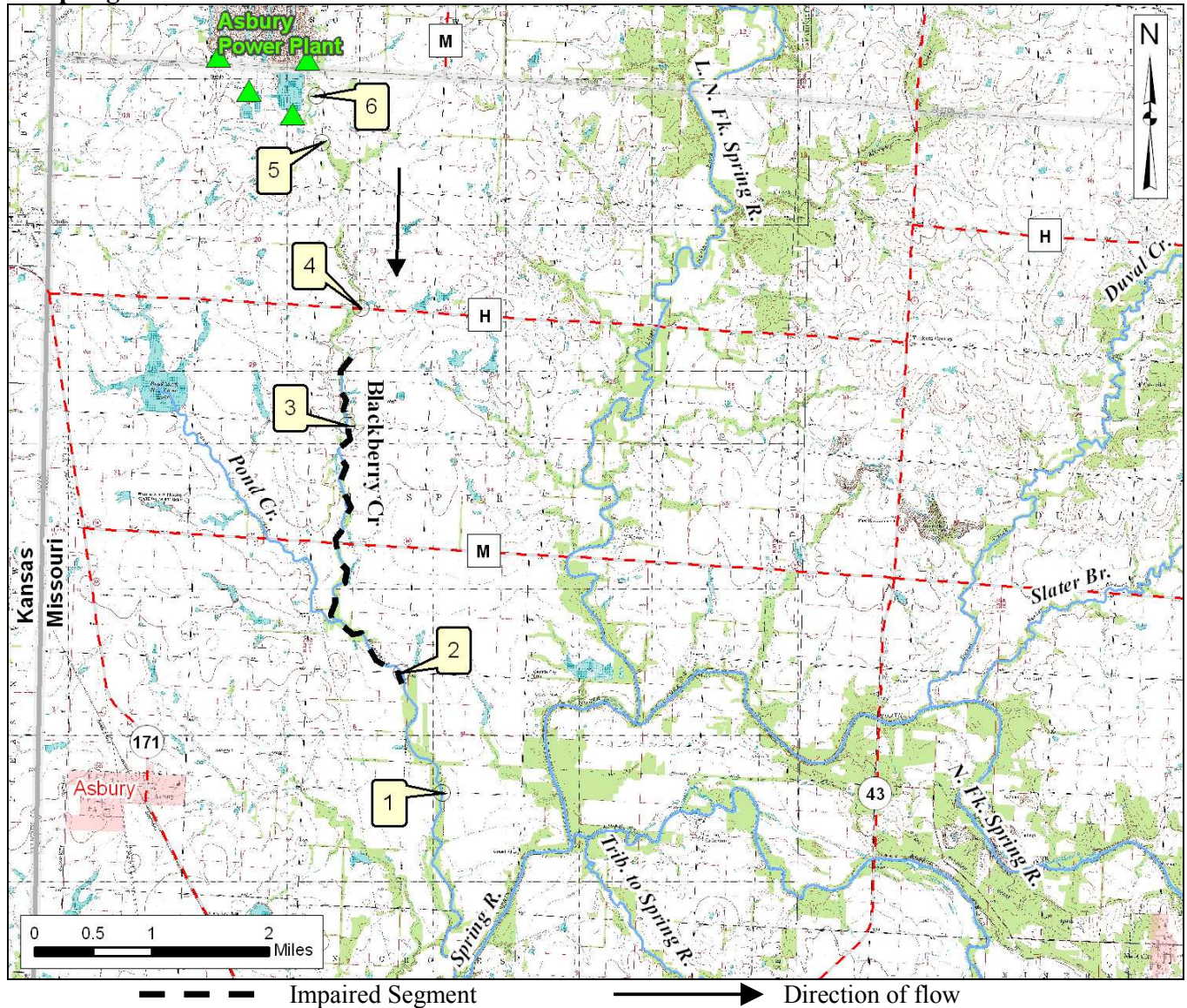
A map of the impaired segment of Blackberry Creek showing the location of the sampling sites may be found on the next page.

<sup>2</sup> Information on the power plant was obtained from POWER Magazine, Vol. 149, Issue 6, 15 Aug-05. Accessed 1/2010 at [www.unitedconveyor.com/cmsdesk/FCKeditor/UserFiles/File/POWERMagazine.htm](http://www.unitedconveyor.com/cmsdesk/FCKeditor/UserFiles/File/POWERMagazine.htm)

<sup>3</sup> EEC data may be found in the department’s Web site at:

[www.dnr.mo.gov/env/wpp/waterquality/303d/2008/proposed-2008-303d-list-data.htm](http://www.dnr.mo.gov/env/wpp/waterquality/303d/2008/proposed-2008-303d-list-data.htm)

# Map Showing the Impaired Segment of Blackberry Creek in Jasper County, Mo., and the Sampling Sites



## Sample Sites

- 1 – Blackberry Cr. 6.9 miles below Asbury PP ash pond
- 2 – Blackberry Cr. 5.6 miles below Asbury PP ash pond
- 3 – Blackberry Cr. 3.2 miles below Asbury PP
- 4 – Blackberry Cr. 2 miles below Asbury PP ash pond
- 5 – Blackberry Cr. 0.4 miles below Asbury PP ash pond
- 6 – Blackberry Cr. above Asbury PP ash pond

## For more information call or write:

Missouri Department of Natural Resources, Water Protection Program  
P.O. Box 176, Jefferson City, MO 65102-0176  
1-800-361-4827 or 573-751-1300 office or 573-522-9920 fax  
Program Home Page: [www.dnr.mo.gov/env/wpp/index.html](http://www.dnr.mo.gov/env/wpp/index.html)